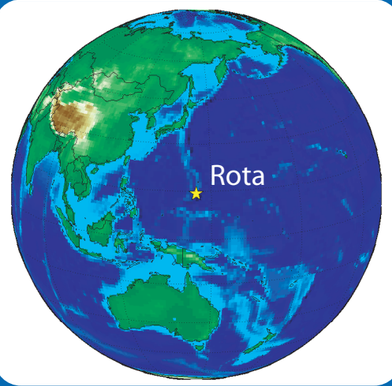
National Oceanographic Data Center
Coral Marine Climate Summary

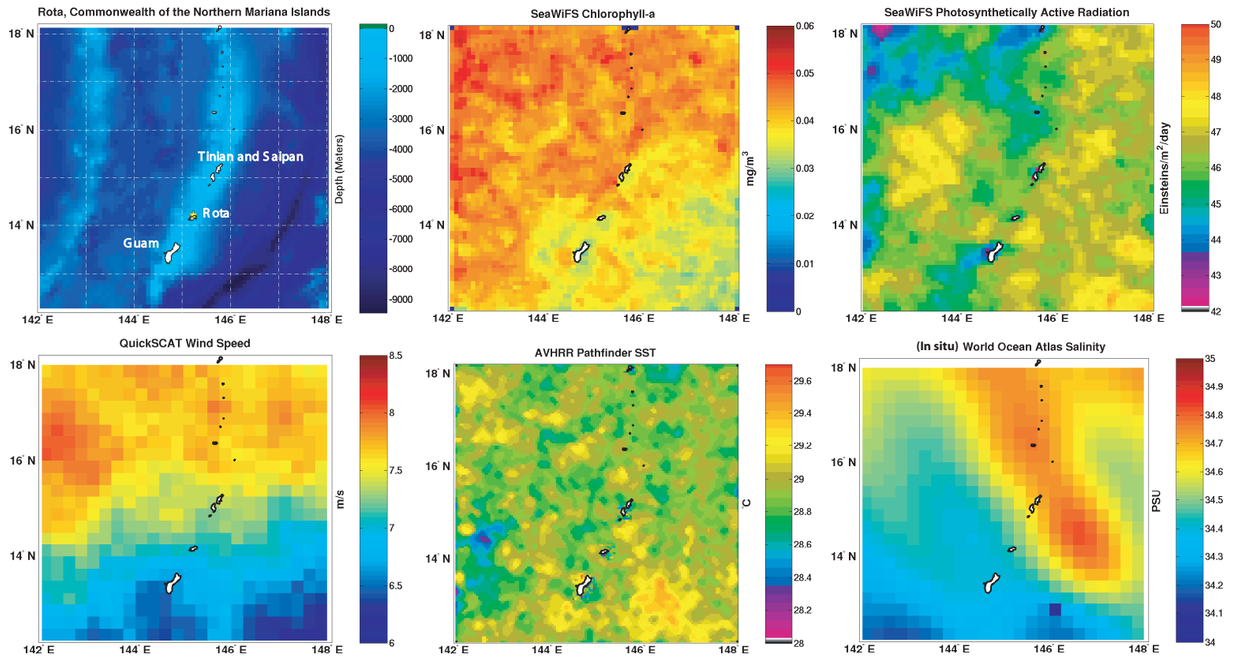
Rota, Commonwealth of the Northern Mariana Islands
Anjota Island, West Dock, Songsong, Taipingot Penninsula, and Sosanjaya Reefs

Background
Location: Rota, Commonwealth of the Northern Mariana Islands
Reef Name(s): Anjota Island, West Dock, Songsong, Taipingot Penninsula, and Sosanjaya
Latitude/Longitude: 14°13.0'N, 145°14.0'E (ReefBase)

Located between Saipan and Guam, Rota is a small island in the Northern Marianas with an area of approximately 32.8 square miles and a population of 3283 (2000 census). While principally an agricultural community, the ocean is of great economic, cultural, and recreational importance. The coral reefs of Rota face natural threats such as cyclones, earthquakes, and Crown-of-Thorns starfish. Anthropogenic threats include sedimentation, pollution, over-fishing, and human-induced climate change (Richmond et al., 2002). Coral bleaching was observed in 1994 (month unknown) and the summer of 2001. This Coral Marine Climate Summary presents the environmental conditions for Rota and the surrounding areas. Climatological maps of various parameters are shown below for the month of September, typically the warmest month for sea surface temperature (SST) at Rota. To the right, time series are shown illustrating past conditions at the reefs.

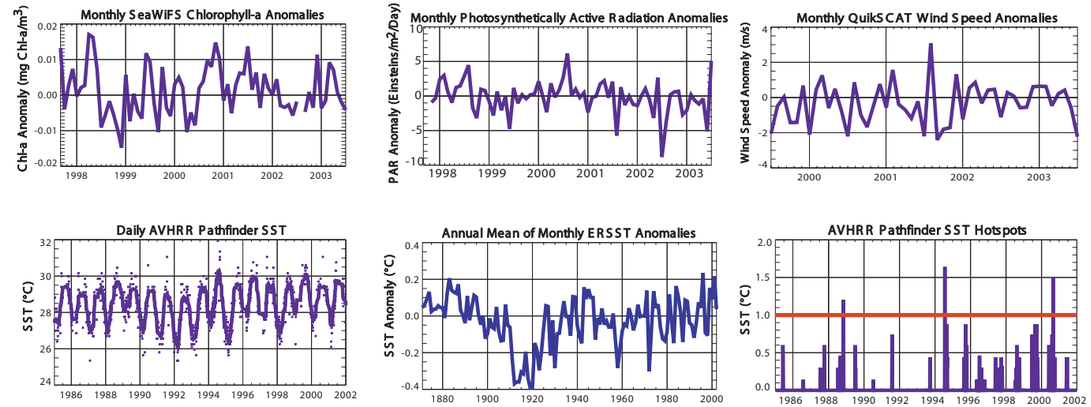


Spatial Climatologies for September



SeaWiFS chlorophyll-a data represent the chlorophyll-a pigment concentration and are processed on a 9 km resolution grid. SeaWiFS photosynthetically active radiation data, also on a 9 km grid, represent the 400-700 nm light incident on the ocean surface. QuikSCAT wind speeds are processed on a 0.25° grid as are the in situ based World Ocean Atlas salinity fields. AVHRR Pathfinder SSTs (Version 5.0) are produced at 4 km resolution by the University of Miami and NODC.

Time Series at Reef Location



The Extended Reconstruction of SST (ERSST) dataset is a globally complete reconstruction of SST based on in-situ measurements and satellite data produced at a monthly, 2° resolution. The AVHRR Pathfinder SST Hotspots are generated by subtracting from 5-day (pentad) mean SST fields the Maximum Pentad Mean Climatology, which represents the warmest SST typically experienced at a given reef location (see the NODC hotspot mapping pages at http://www.nodc.noaa.gov/sog/hotspots/ for more information). Hotspot anomalies exceeding the 1°C threshold (shown in red) often relate to coral bleaching events (for more information on real-time hotspot monitoring see the NOAA real-time Coral Reef Watch coral bleaching monitoring site at http://orbit-net.nesdis.noaa.gov/orad/coral_bleaching_index.html).

Summary
- The warmest year in the AVHRR Pathfinder SST satellite record is 1994, coinciding with coral bleaching of 1994
- Strong hotspots are observed in 1988, 1994, and 2001
- The hotspots of 1994 and 2001 are accompanied by coral bleaching
- The coldest period in the ERSST record was from 1910-1920
- Relatively low spatial variability of SST is seen in the region
- A strong NW-SE gradient in September wind speed is observed in the region
- Low wind speed, high SST, and coral bleaching were observed together in late summer of 2001

For More Information
NODC Coral Marine Climate Summaries can be generated for any reef location in the world. Please contact Dr. Kenneth S. Casey (Ken.Casey@noaa.gov) or Andrew Barton (Andrew.Barton@noaa.gov) at the NOAA National Oceanographic Data Center for more information or to request a summary for a specific location or region.
See http://www.nodc.noaa.gov/sog for electronic copies of this Coral Marine Climate Summary (20030915_Rota_CNMI.pdf).

Acknowledgements
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References:
Richmond et al., 2002, Status of the Coral Reefs in Micronesia and American Samoa: US Affiliated and Freely Associated Islands in the Pacific. In: C.R. Wilkinson (ed.), Status of coral reefs of the world:2002. GCRMN Report, Australian Institute of Marine Science, Townsville. Chapter 12, pp 217-236.